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VASCULAR DISEASE

ASSOCIATION OF SERUM CONCENTRATION OF BILIRUBIN WITH CORONARY ENDOTHELIAL FUNCTION; THE RELATIONSHIP BETWEEN BILIRUBIN AND OXIDATIVE STRESS, INFLAMMATORY MEDIATOR AND LIPID/GLUCOSE METABOLISM

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Background: Bilirubin is a well-known antioxidant to protect from coronary heart disease (CHD). Therefore, we examined the relation of bilirubin level with coronary endothelial function.

Methods: The study population consisted of 141 patients without CHD underwent Doppler flow study. Vascular reactivity was examined by intra-coronary administration of acetylcholine (Ach) and nitroglycerin (NTG) using a Doppler guidewire. Coronary endothelial function was evaluated by the response of coronary blood flow (CBF) and coronary artery diameter (CAD) to Ach. Serum bilirubin, Malondialdehyde-modified LDL (MDA-LDL), high sensitive C-reactive protein (hs-CRP), LDL-cholesterol (LDL-C), high density lipoprotein-cholesterol (HDL-C), fasting plasma glucose (FPG) and immuno-reactive insulin (IRI) were also measured. Homeostasis model assessment insulin resistance index (HOMA-R) and estimated glomerular filtration rate (eGFR) were calculated.

Results: A monovariate analysis revealed that both %change in CBF and CAD by Ach were positively correlated with log-transformed bilirubin ($r=0.22$, $p<0.05$; $r=0.20$, $p<0.05$, respectively). %change in CBF by Ach showed a positive correlation with eGFR ($r=0.24$, $p<0.05$) and an inverse correlation with age, LDL-C and log-transformed FPG ($r=-0.24$, $p<0.05$, $r=-0.17$, $p<0.05$, $r=-0.22$, $p<0.05$, respectively). A multivariate analysis revealed that log-transformed bilirubin was the only independent predictor of %change in CBF by Ach. Log-transformed bilirubin concentration presented an inverse correlation with log-transformed MDA-LDL, hs-CRP, IRI and HOMA-R ($r=-0.20$, $p<0.05$, $r=-0.26$, $p<0.001$, $r=-0.26$, $p<0.05$, $r=-0.30$, $p<0.05$, respectively), and a positive correlation with HDL-C ($r=0.21$, $p<0.05$). A multivariate analysis revealed that log-transformed hs-CRP and HDL-C were the independent predictors of log-transformed bilirubin.

Conclusion: These results suggest that high bilirubin level is associated with favorable coronary endothelial function, which may be caused by the effect of anti-inflammation and increasing HDL-C.